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graded hierarchy of forms, the inanimate thing, the animate, man, angels, and finally the deity, is cut transversely by a dualistically conceived distinction between the spiritual and material. The point at which this series of substances is traversed by the other conception is the never thoroughly bridged gap between the animal-like powers of man and the power of intellect. As we shall see, this bisection necessitates a readjustment of every element of the series.

In short, form as form can not be the same wherever it occurs. Either the form of man contains that which contrasts it with the general immateriality of form, or in addition to the body-form there is another sort of form partaking of a different nature. Aquinas can not openly equate form and spirit: and he can not avoid doing it surreptitiously. It is the play on the terms substance, form, and matter that smoothes over many awkward situations. Substance at one moment implies that potentiality which is called matter in the matter-form distinction; at another it secretly implies a kind of matter wholly different from corporeality. Again, substance as essence (pure form) has no kind of matter at all; yet there exists immaterial intellectual substances which consist of some stuff—they are spiritual substances. Forms, as essences, are susceptible of hierarchical arrangement based on logical distinctions (accidental and substantial, adherent and separate), with those archetypal forms, the ideas of God, at the summit. But forms are also arranged on a basis of ethico-religious valuation, and this introduces the concept of spirituality and prejudices the relation of form to matter as that of realization to potentiality. To the extent that the spiritual receives its definition from the spirit-matter antithesis, to that extent matter can have no conceivable relation to form, and to that extent matter and form are logically opposed conceptions, and not complementaries.

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(*To be continued.*)

REVIEWS AND ABSTRACTS OF LITERATURE

Acquisition of Skill. WILLIAM HOWARD BATSON. Psychological Review Monograph Supplement, Vol. 21, 1916.

The author, from a review of the literature on the acquisition of skill, raises questions on the following points: the influence of objective and subjective factors on different types of learning and on the same type of learning at different stages of development, the daily fluctuation in the curve, the effect of short and long periods of rest, and plateaus. He seeks to get more information in answer to these questions, and to gain such information on the other points pertaining to learning, as the data will afford.

The first experiment consists of ball tossing by four subjects, extending over several months, on which complete data are given. The elements in the ball tossing are the next subject of investigation. (1) The judgment of direction: measured by rolling a steel ball on a smooth board with arrangements for scoring in terms of deviation from the target. (2) The judgment of force: measured by a similar device, the scoring being done in distance units, separating the target from the place the thrown ball falls. (3) The problem of the judgment of time: measured by having the subject learn to release BB shot from a pocket at the proper time for the shot to run down a trough and fall into a series of pockets on a vertical wheel revolving at the rate of 46 times per minute. Tabulated data, curves, and ample explanatory discussion of the same are given.

The ball-tossing experiment is one in which attention to the main phases of the problem must be simultaneous. The author introduced a complex problem, containing, in the main, the chief phases of the ball-tossing problem in the learning of which each element can be attended to singly until mastered and the whole problem integrated. The subject (using a pair of tongs), picked shot from eight small pockets on a disk rotating at a speed of eleven times per minute, and threw the shot into a small bag held in a closed frame about 23 inches to the right of the subject, about eight inches above the level of the table on which the disk was placed. The picking up, the distance judging, the time process, and the motor coordination of each separate process were attended to separately by at least some of the subjects, as is apparent from the analysis.

The conclusions may be summarized briefly thus: the plateaus of learning depend upon factors involved in the process to be learned and are restricted to problems of complex nature; objective and subjective conditions determine daily fluctuations; the general curve of learning depends upon both the problem and the attention of the subject; simple problems have a typical learning curve and complex problems may have a typical curve; there is a slight evidence of the warming-up process; the short rest periods have little or no effect on the work; after a long rest period the subject is found to be in a condition to improve rapidly and in some cases the subjects showed they had really gained power during the rest.

The author has presented in a very clear-cut manner his problem data, analyses, and curves, with ample discussion, and seems to have realized the aims he professed in starting the investigation. The monograph will be of interest and value to those at all concerned with the general question of learning and particularly to those who are studying the question of development of skill. A brief but well-chosen bibliography is given.

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Two Studies in Mental Tests. CARL C. BRIGHAM. Princeton. Psychological Monographs, No. 1, 1917. Pp. 254.

I. *Variable Factors in the Binet Tests.*—This study reports results obtained by giving Goddard's 1911 revision of the Binet-Simon scale to 422 children below the seventh grade in the Princeton, New Jersey, Model School. It seeks to determine the influence of the personal equation of the examiners who gave the tests, the influence of grade training and sex differences, and the correlations of the individual tests with age. The four examiners had been trained in methods of psychological experimentation. Three of them studied the tests together and discussed their results at the close of the day's work in order to facilitate the acquisition of uniform methods. Regardless of these precautions, it was shown that one of the experimenters was unmistakably in error on some of the tests, scoring the girls more leniently than the boys. For the correlations, only such tests were used as were shown to be free from the personal equation of the examiners.

The correlations of the individual tests with grade were found to be higher than with age. This fact was taken as indirect evidence of the value of the tests as measures of intelligence. Some tests showed the effect of school training. No demonstrable differences between the sexes were shown, the cases of apparent difference being confused with age and with grade training. Dr. Brigham suggests that investigators who are to use the results for the standardization of age norms should use the complete method of experimentation, *i. e.*, of giving all tests to all children tested. Also, he says that the results should be so grouped as to show the absence or presence of grade training and sex differences.

II. *Diagnostic Value of Some Mental Tests.*—The purpose of this study was to determine the value of individual tests when used for the purpose of separating groups of different intelligence. Selected tests from Town's and Goddard's translations of Binet's 1911 scale and ten sets of supplementary tests as nearly independent as possible of language ability were used. One experimenter, Dr. Brigham, gave the tests to two groups of children in the schools of Trenton, New Jersey. One group was composed of normal children